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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,616	02/13/2002	Silvano Gai	112025-0482	7341
24267	7590	02/09/2005	EXAMINER	
CESARI AND MCKENNA, LLP 88 BLACK FALCON AVENUE BOSTON, MA 02210			FILIPCZYK, MARCIN R	
			ART UNIT	PAPER NUMBER
			2161	

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/074,616	<b>Applicant(s)</b> GAI ET AL.	
	<b>Examiner</b> Marc R Filipczyk	<b>Art Unit</b> 2161	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 8-12 is/are objected to.
- 8) ☒ Claim(s) 13-20 are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. <u>1-18-05</u> |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                                 |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This Action is responsive to application filed on February 13, 2002 in which claims 1-20 are presented for examination.

#### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-12 are drawn to pattern matching, classified in class 707, subclass 6.
  - II. Claims 13-20 are drawn to a accessing content addressable memory (CAM), classified in class 711, subclass 108.
2. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable.

In the instant case invention I (pattern matching) has separate utility such as searching patterns. Invention II (accessing CAM) has separate utility such as in any data systems.
3. Because these inventions are distinct and search Groups I and II are not required to be simultaneous, restriction for examination purposes as indicated is proper.
4. Examiner has conducted a telephone interview with Sidney Johnston on January 18, 2005 wherein the Applicants elected Group I, claims 1-12 with traverse.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Specification***

The disclosure is objected to because of the following informalities: On page 12, line 28, "valve" should be replaced with "value".

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2 and 7-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 2, the segment, "metacharacters are a wildcard metacharacter" is indefinite. The plurality of metacharacters is inconsistent. Second, "followed immediately by a

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repeat last character zero” is indefinite. It is not clear what the Applicants mean by repeat last character zero.

Regarding claim 7, the feature “mismatch pattern includes **all** don’t care values” is indefinite. It is not clear how the mismatch pattern includes all don’t care values.

Regarding claims 8-12 depend from claim 7 respectfully, therefore claims 8-12 are rejected on the same merits.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Fritchman (U.S. Patent No 6,785,677).**

Regarding claims 1 and 2, Fritchman discloses a method for programming a pattern matching engine having a plurality of information storage entries with one or more regular expressions (fig. 2, block 20), each regular expression including a plurality of characters and having a corresponding action to be applied to matching strings, the method comprising the steps of:

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identifying one or more borders within a given regular expression, the one or more borders separating the given regular expression into a plurality of sub-expressions, at least one sub-expression having a plurality of sequential characters (figs. 3A-3C); and

loading one or more entries of the pattern matching engine with a plurality of the sequential characters from at least one sub-expression, (fig. 2, block 21, PATTERN; *preprocessing pattern.string*); wherein

the borders are defined by a predetermined sequence of regular expression metacharacters, the metacharacters being wildcards (col. 7, Table; “\_” and “%”).

Regarding claim 3, Fritchman discloses organizing at least part of the pattern matching engine into a plurality of sections, and wherein each section of the pattern matching engine is loaded with a plurality of search patterns for a corresponding sub-expression (fig. 2, block 21 and figs. 3A-3C);

Regarding claim 4, Fritchman discloses one of the search patterns includes a complete match of the respective sub-expression, a search pattern that includes a partial match of the respective sub-expression, and a mismatch pattern (fig. 2, block 22)

(Note: each pattern has a complete match, partial match and mismatch depending on the target string)

Regarding claim 5, Fritchman discloses associating at least one sub-expression with a current variable (figs. 4A-4C); and

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loading the associated current state variable into each entry of the section of the pattern matching engine that contains the at least one sub-expression (fig. 2, blocks 22 and 23; TARGET *matched strings*, and figs. 4A-4C) .

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

**Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fritchman (U.S. Patent No 6,785,677) in view of Kaldani et al (U.S. Patent No. 6,741,591).**

Regarding claim 6, Fritchman discloses all of the claimed subject matter as discussed above including a pattern search engine loaded with a regular expression (fig. 2, block 20) but does not expressly teach that the search engine has a content addressable memory (CAM). One of the benefits of a CAM is allowing program access to and from the memory (CAM).

Kaldani teaches a search engine using a ternary CAM to store data for pattern matching (abstract and fig. 1).

Note, Fritchman uses a program to access the memory system's content (abstract, Fritchman). Hence, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to store Fritchman's data in a CAM since Fritchman's memory system supports and enables program interaction (abstract, Fritchman). One would have been motivated to combine the two pattern matching systems because both systems are compatible by supporting program access to memory and Fritchman system would benefit from the format advantages of using a ternary CAM.

Regarding claim 7, Fritchman/Kaldani teach the CAM is a ternary CAM (fig. 1, item 16, Kaldani) that supports don't care values (col. 7, table; *wildcards*, Fritchman), and

the mismatch pattern includes don't care values (fig. 2, block 22, TARGET; values RS, Fritchman).



***Allowable Subject Matter***

Claims 8-12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Regarding claim 8, the prior art of record or that encountered in searching for the invention, fails to disclose or suggest each regular expression is associated with an action, the pattern matching engine having a second memory device having a plurality of entries and that the entries of the second memory device are loaded with the actions associated with the one or more regular expression as claimed in combination with claims 1-7 from which claim 8 depends from.

Regarding claims 9-12 are also allowable because they depend from allowable claim 8.

***Conclusion***

To expedite the process of examination Examiner requests that all future correspondences in regard to overcoming prior art rejections or other issues (e.g. amendments, 35 U.S.C. 112, objections and the like) set forth by the Examiner that Applicants provide and link to the most specific page and line numbers of the disclosure where the best support is found (see 35 U.S.C. 132).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents further demonstrate the state of art with respect to plural pattern search engines ('239 and '725) and TCAM ('331):

U.S. Patent No. 5,794,239 of Walster et al.

U.S. Patent No. 6,665,725 of Dietz et al.

U.S. Patent No. 6,591,331 of Khanna


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc R Filipczyk whose telephone number is (571) 272-4019. The examiner can normally be reached on Mon-Fri, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on (571) 272-4023. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MF  
January 25, 2005

  
**FRANTZ COBY**  
**PRIMARY EXAMINER**